Abstract Submitted
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Onset of collective flow due to Weibel instabilities[1] JORGEN RANDRUP, Lawrence Berkeley National Laboratory, USA, STANISŁAW MRÓWCZYŃSKI, Sołtan Institute for Nuclear Studies, Warzaw, and Institute of Physics, Swiętokrzyska Academy, Kielce, Poland — Since the local momentum density is highly anisotropic at the early stage of an ultra-relativistic nuclear collision, it is expected that Weibel instabilities will generate color currents with a characteristic (preferentially transverse) wave vector. As demonstrated first by Ampére, different currents repel and in the SU(3) plasma there is therefore a net tendency for the Weibel currents to experience a mutual repulsion. This feature is phenomenologically important since the associated increase of the pressure provides a mechanism for the early development of collective flow. For the purpose of establishing a framework for examining this effect, we have extended our earlier work to encompass the evolving correlation function for the local momentum density. Starting from the fluctuations in a free gas of gluons, quarks and anti-quarks, we treat the self-consistent feed-back of the amplified chromodynamic fields on the phase-space densities.

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